What is claimed is:

1.   A combined television (TV) and frequency modulation (FM) radio receiver, comprising:

a tuner that selects TV band signals or FM radio band signals and converts the selected TV band signals into intermediate frequency (IF) signals if the TV band signals are selected and converts the selected FM radio band signals into primary sound IF signals if the FM radio band signals are selected;

an IF processor that generates first local oscillating signals if a current mode is a TV mode and generates second local oscillating signals if the current mode is an FM radio mode, and converts the IF signals into first baseband signals and first secondary sound IF signals, and/or converts the primary sound IF signals into second secondary sound IF signals;

a video demodulator that extracts video signals from the first baseband signals output from the IF processor;

an audio demodulator that extracts TV audio signals from the first secondary sound IF signals according to TV sound mode data and/or FM audio signals from the second secondary sound IF signals output from the IF processor according to FM radio mode data; and

a controller that controls the selection of the tuner based on TV channel selection data or FM radio channel selection data, controls the IF processor to generate the first local oscillating frequency signals if the current mode is the TV mode and generate second local oscillating frequency signals

10

if the current mode is the FM radio mode, and applies the TV sound or FM radio mode data to the audio demodulator.

2.   The combined TV and FM radio receiver of claim 1, further comprising a surface acoustic wave (SAW) filter passing TV video and audio band signals from the IF signals, or FM radio band signals from the primary sound IF signals, output from the tuner, and the IF processor converts the TV video and audio signals into first baseband signals and first secondary sound IF signals, respectively, or the primary sound IF signals into second secondary sound IF signals.

3.   The combined TV and FM radio receiver of claim 1, wherein the IF processor includes:

a local oscillator that generates one of the first and second local oscillating signals for respective TV mode and FM radio mode, wherein the TV and FM radio modes are predetermined;

a mixer that mixes the first oscillating signals with the IF signals to generate second baseband signals if the current mode is the TV mode, and mixing the second oscillating signals with the primary sound IF signals to generate the second secondary sound IF signals, if the current mode is the FM radio mode, as mixing results;

an analog-to-digital converter (ADC) that converts the second baseband signals output from the mixer into digital baseband signals;

a digital filter that separates the digital baseband signals output from the ADC into video signals and sound signals via a predetermined digital filtering algorithm;

a first digital-to-analog converter (DAC) that converts the digital video signals output from the digital filter into analog video signals; and

a second DAC that converts the digital sound signals output from the digital filter into analog sound signals.

4. The combined TV and FM radio receiver of claim 3, further comprising a bandpass filter passing baseband signals of a selected channel among the second baseband signals output from the mixer, wherein the analog-to-digital converter (ADC) converts the baseband signals of the selected channel output from the mixer into the digital baseband signals.

5. The combined TV and FM radio receiver of claim 1, wherein the audio demodulator extracts the TV sound signals from the first secondary sound IF signals via quadrature demodulation and extracts the FM audio signals from the second secondary sound IF signals via FM phase locked loop (PLL) demodulation.

6. The combined TV and FM radio receiver of claim 1, wherein the controller produces an on-screen display (OSD) that displays predetermined information including channel information, when in the FM radio mode.

7.   A combined television (TV) and frequency modulation (FM) radio receiver, comprising:

means for tuning including selecting TV band signals or FM radio band signals and converting the selected TV band signals into intermediate frequency (IF) signals if the TV band signals are selected and converting the selected FM radio band signals into primary sound IF signals if the FM radio band signals are selected;

means for processing signals including generating first local oscillating signals if a current mode is a TV mode and generating second local oscillating signals if the current mode is an FM radio mode, and converting the IF signals into first baseband signals and first secondary sound IF signals, and/or converting the primary sound IF signals into second secondary sound IF signals;

means for extracting video signals from the baseband signals output from the means for processing signals;

means for extracting audio signals including extracting TV audio signals from the first secondary sound IF signals according to TV sound mode data and/or extracting FM audio signals from the second secondary sound IF signals according to FM radio mode data; and

means for controlling including controlling the means for tuning based on TV channel selection data or FM radio channel selection data, controlling the means for processing signals to generate the first local oscillating frequency signals if the current mode is the TV mode and generate second

13

local oscillating frequency signals if the current mode is the FM radio mode, and applying one of the TV sound and FM radio mode data to the means for extracting audio signals.

8.   A method of processing television (TV) and frequency modulation (FM) radio signals, said method comprising:

selecting one of TV band signals and FM radio band signals;

converting the selected TV band signal into intermediate frequency (IF) signals if the TV band signals are selected and converting the selected FM radio band signals into primary sound IF signals if the FM radio band signals are selected;

generating first oscillating signals if a current mode is a TV mode and generating second oscillating signals if the current mode is an FM radio mode;

converting the IF signals into first baseband signals and first secondary sound IF signals, and/or the primary sound IF signals into second secondary sound IF signals;

extracting video signals from the baseband signals;

extracting TV audio signals from the first secondary sound IF signals according to TV sound mode data and/or extracting FM audio signals from the second secondary sound IF signals according to FM radio mode data; and

controlling the selecting of one of TV band signals and FM radio band signals based on TV channel selection data or FM radio channel selection data;

14

controlling the generating of first and second local oscillating frequency signals depending on the current mode; and

controlling the extracting of TV audio signals and the extracting of FM radio signals by applying the TV sound mode data and the FM radio mode data, respectively.